II. *New Experiments upon* Ice; *taken from* Abbé Nolet, *F. R. S. at* Paris, *and communicated by* J. T. Deſaguliers, *F. R. S.*

1. ICE that begins to melt, and Water that begins to freeze, have always the ſame Degree of Cold.

2. That Cold may be increas'd by a Mixture of Salts.

3. It has been thought for a long time, that *Salt-petre* was moſt fit to increaſe the Cold of *Ice*; but Experiments have ſhewn, that few Salts increaſe Cold ſo little as that Salt. Mix one Part of fine *Salt-petre* with two Parts of beaten *Ice*, and *Monſ. Reaumur's* Thermometer will deſcend in it but 3$\frac{1}{2}$ Degrees below the freezing Point.

What had caus'd this Miſtake, is, that People generally made uſe of *Salt-petre* of the firſt or ſecond Melting, as being the cheapeſt; but that *Salt-petre* not being purified, contains a great deal of *Sea-Salt*; and it was in Proportion to the Quantity of the *Sea-Salt* that the Effect was the greater.

From this laſt Obſervation, one may deduce an advantageous Method for trying *Gunpowder*; for as of the three Ingredients of which it is made up, *Salt-petre* is the only one that can increaſe the Cold of *Ice*; if one Part of *Gunpowder*, or a little more, be mix'd with two Parts of *Ice*, and it increaſes its Cold more than 3$\frac{1}{2}$ Degrees, it is a Sign that the *Salt petre* contain'd in it is not well purified; and the beſt Powder will be that which does leaſt increaſe the Cold of *Ice*.

4. *Sea-Salt*, that is the *Bay-Salt*, which is commonly us'd at Table in *France*, and that which is immediately taken from the Mines, call'd *Sal gemmæ*, give the greateſt Degree of Cold, for the moſt part; for *Pot-aſh* gives ſometimes a little more, but generally leſs. *Sea-Salt* mix'd with *Ice* in the aboveſaid Proportion, gives 15 Degrees of Cold on *Monſ. Reaumur*'s Thermometer, and *Sal-gem.* 17.

5.	*Aſhes* of *green Wood*	3 Degrees.
6.	of *Sea-Coal*	
7.	of *Vitriol*	2
8.	*Tartar*	10
9.	Common *Pot-aſh* (in *French* call'd *Soude ordinaire*)	3
10.	*Pot-aſh* made of *Vreck* or *Sea-weed*	11

This laſt *Pot-aſh* may be ſubſtituted inſtead of *Sea-Salt*, for making *Ice-Creams*, in Places where *Salt* is dear, as in *France*, where it is ſold for 10 Sols a Pound.

1*ſt*, Becauſe in *France* this *Pot-aſh* is ſold only for 2½ Sols a Pound.

2*dly*, Becauſe, not freezing ſo faſt, it does not ſpoil the Creams by reducing them to Iſicles.

3*dly*, Becauſe *Ice-Creams* made this way, will keep longer in a Condition fit to ſerve at Table.

11.	*Sugar*	4 Degrees.
12.	*Allom*	1½
13.	*Salt* of *Glaſs*	10

14. *Sal Ammoniac* . . . . . $12\frac{2}{3}$ Degrees.
15. *Quick-Lime* . . . . . $1\frac{1}{4}$
16. *Sal Glauberi* 2

17. The Cold of *Ice* may ſtill be conſiderably increas'd by a Mixture of *Spirit of Wine*; about a Drinking-glaſs full of *Spirit of Wine* to a Pound of beaten *Ice*.

18. The Cold of *Ice* will not increaſe, unleſs the *Ice* melts.

EXPERIMENTS.

Put into one Veſſel four Ounces of *Ice* beaten very ſmall, and into another Veſſel two Ounces of *Sea-Salt*; ſet the two Veſſels in a Mixture of *Ice* and *Salt*, which is to be renew'd ſtill, till by means of the Thermometer you find, that the *Salt* and the *Ice* of the two firſt Veſſels have acquir'd each of them 10 or 12 Degrees of Cold; then mix your *Salt* with your *Ice*, and this Mixture will not increaſe the Degree of Cold that the Ingredients had acquir'd, becauſe the Mixture does not melt.

But if inſtead of *Salt* you mix'd with your *Ice* *Spirit of Nitre* cool'd to the ſame Degree as the *Ice*, as this laſt is liquid, it will melt the *Ice*, and conſiderably increaſe its Cold.

19. Salt mix'd with Water, increaſes its Cold.

20. Of all Salts, *Sal Ammoniac* gives the greateſt Degree of Cold; ſo that if that Salt has been cool'd in *Ice*, and then one Part of it be thrown into two Parts of Water cool'd to the ſame Degree in *Ice*, that Water will become colder than *Ice*, and will freeze other Water thrown into it in a ſmall Quantity.

This laſt Obſervation may be applied to the cooling of Liquors where no *Ice* is to be had; for there is hardly any Place, but what has Wells: Now the Water of a Well moderately deep, wants about eight or 10 Degrees of the Cold of *Ice*; and *Sal Ammoniac* being cool'd beforehand in the Well, will, by mixing with ſome of the Water of that Well, come very near to the Cold of *Ice*.

III. *An Obſervation of the* Magnetic Needle *being ſo* affected *by great* Cold, *that it would not traverſe; by Capt.* Chriſtopher Middleton, *F. R. S.*

IN a Letter which was publiſh'd ſome Years ago in the *Philoſophical Tranſactions*, (N° 418.) I made Mention of a ſtrange *Phænomenon* relating to the Sea-Compaſs, which I had frequently obſerved, when we were among the Ice in *Hudſon's-Bay*; to wit, that the magnetic Virtue of the Needle was ſo far loſt or deſtroyed, that it would not traverſe as uſual, even when the Ship was in a conſiderable Motion: And in my Voyage thither laſt Year, I obſerved our Compaſs would not move at all, any longer than the Quarter-Maſter kept touching it. We had then much Snow on the Land, and many Iſles of Ice around us, and the Sea not very ſmooth: I order'd one of the Compaſſes to be brought into the Cabin, but did not find it any better, till it had ſtood near the Fire about a Quarter of an Hour, and then it began to traverſe very well; I then order'd it to be placed in the Binnacle,